Danish Translation and Adaptation of the Context Assessment Index (CAI) with Implications for Evidence based Practice

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Journal:	*Worldviews on Evidence-Based Nursing*
Manuscript ID	WVN-18-125.R2
Manuscript Type:	Original Article
Keywords:	Research Methods, Instrument development/Tool development/Test construction/Psychom, Nursing Practice, Cultural issues, Education/Curriculum/learning, Evidence-based practice, Professional issues/Professional ethics/Professional standards, Survey

11-Sep-2018

Dear Reviewers.

Thank you for the minor suggestions regarding our manuscript ID WVN-18-125.R1 titled "Danish Translation and Adaptation of the Context Assessment Index (CAI) with Implications for Evidence-based Practice".

We have addressed all the comments from the reviewer and included in the attached reply to reviewers/cover letter.

All changes in the revised article are highlighted in yellow, including one line that has been removed.

We hope you find the paper suitable for publication and thank you for this opportunity.

Reviewer: 1	**Authors responses and actions:**
Page 3, lines 39-42, what does "For both models, factor loadings and fit statistics were factor model RMSEA 0.07, CFI=0.923" mean? I am confused.	This has now been corrected to the following in the abstract, Results, page 1, line 14: *For both models, factor loadings and fit statistics were acceptable, appropriate and statistically significant and the measurement models were confirmed (5-factor model RMSEA 0.07, CFI=0.923; 3-factor model RMSEA 0.07, CFI=0.924).*
From the results, I cannot find that the three-factor model is more advantageous than the five-factor model.	We are sorry that we did not make this clearer. It is written in the text that the three factor model is no more advantageous, but rather the three factor model aligned closer to the PARIHS framework, which we use in our program of research. (p 1, Results and Linking Evidence to Action*: Cronbach alpha scores showed the models to have broadly acceptable scores (5-factor 0.64 – 0.89; 3-factor model 0.72 – 0.89)* and: *The three-factor model can advantageously be used when the PARIHS framework is part of the project*.)(S. 9 line 5 – 9: *There are two competing measurement models to explain the factor structure of the CAI. McCormack et al (2009) reported strong statistical evidence of a five-factor model, however Kajermo et al (2013) could not confirm the five-factor model and suggested the need to explore a theoretically derived three-factor model that aligned with elements relating to the construct 'Context' in the PARIHS framework*.)
Also, it is better to provide the specific values of Cronbach alpha scores in the Results.	Thank you for this comment. We have now provided those in Results in the abstract p 1, line 15: *Cronbach alpha scores showed the models to have broadly acceptable scores (5-factor 0.64 – 0.89; 3-factor model 0.72 – 0.89).*

I recommend to introduce the original version of CAI in the Methods including its construct and measurement properties.	We have now introduced the original five-factor CAI model in the Methods section including referring to the original for its construct and measurement properties, p. 4, line. 7 – 10*: the original model measures a 5-factor model of Collaborative Practice, Evidence informed Practice, Respect for Persons, Practice Boundaries, Evaluation. The 5-factor model has been reported to have acceptable psychometric properties (McCormack et al., 2009).*
Page 10, lines 24, what is the whole questionnaire? Which sections are included in the whole questionnaire? Demographic data and CAI? I am not clear. Lines 41-42, how to define incomplete questionnaires?	This is now mentioned in Phase 2: Distribution of the survey, p 6. line.9-16: *The survey consisted of three elements: demographic data, the translation of the CAI, and a number of self-developed questions concerning the nurses attitudes and experiences regarding research in general and the implementation of new knowledge in practice in their local context. The three elements were gathered in an on-line survey developed in SurveyXact ("SurveyXact by Ramboll," 2018), a secure data management application that has certified access and encrypted communica-tion. A personal link combined the email with the name of the individual nurse and the specific hy-perlink to the survey. The link could be activated whenever wanted. In this paper, we only report the results from the CAI*.
Lines 41-42, how to define incomplete questionnaires?	Thank you for identifying our error, this should read: Incomplete responses. It has been changed in the text, p 8. line 16: *Incomplete responses (n=164) were excluded from the sample.*
Page 11, line 3-5, I recommend to put "(KMO >0.9 is excellent, Bartletts measure significant (Hutcheson & Sofroniou, 1999))" into statistical analysis section.	Thank you for this suggestion. We have moved it to the start of section: Phase 3: Data analysis, p 7. line. 9-10*: The 37-item instrument was tested for appropriateness for factor analysis using Kaiser-Meyer-Olkin measures of sampling adequacy and the Bartlett's test for Sphericity (KMO >0.9 is excellent, Bartletts measure significant (Hutcheson & Sofroniou, 1999).*
From the results of confirmatory factor analysis, how to decide the three-factor model is better than the five-factor model, only based on the findings of Cronbach alpha scores?	As mentioned above, neither of the models were better than the other as both were strong psychometrically (with the exception of a slightly rogue Cronbach's alpha measure in 'evaluation' of the 5-factor model). We mentioned that the three-factor model was chosen because it aligned to the PARIHS framework, we hope that this is clear now. P 1, Results and Linking Evidence to Action*: Cronbach alpha scores showed the models to have broadly acceptable scores (5-factor 0.64 – 0.89; 3-factor model 0.72 – 0.89)* and: *The three-factor model can advantageously be used when the PARIHS framework is*

	part of the project.)(P 9, line 5 – 9*: There are two competing measurement models to explain the factor structure of the CAI. McCormack et al (2009) reported strong statistical evidence of a five-factor model, however Kajermo et al (2013) could not confirm the five-factor model and suggested the need to explore a theoretically derived three-factor model that aligned with elements relating to the construct 'Context' in the PARIHS framework.)*

Abstract

Background: Healthcare contexts are rapidly changing with growing demand for health services to accommodate an ageing population and financial pressures. Assessment of context in healthcare settings has been the subject of increasing debate. The Context Assessment Index (CAI) examines three interconnected contextual elements derived from the PARIHS-Framework with the purpose of providing practitioners with an understanding of the context in which they work.

Aims: 1: To describe the translation of the CAI into Danish and adapt the instrument for use in Danish hospitals. 2: To evaluate the psychometric properties of the Danish version of the CAI.

Methods: Translation and adaption included an expert panel and a translation/back-translation process. The CAI was then sent to 4416 nurses in the Region Zealand, Denmark.

There are two alternative measurement models to explain the factor structure of the CAI, the five-factor model and the three-factor model. In order to provide the best explanation for the data both measurement models were examined using confirmatory factor analysis.

Results: The CAI was translated and modified based on expert review and usability testing. 2261 nurses completed the CAI. For both models, factor loadings and fit statistics were acceptable, appropriate and statistically significant, and the measurement models were confirmed (5-factor model RMSEA 0.07, CFI=0.923; 3-factor model RMSEA 0.07, CFI=0.924). Cronbach alpha scores showed the models to have broadly acceptable scores (5-factor 0.64 – 0.89; 3-factor model 0.72 – 0.89).

Linking Evidence to Action: The three-factor model can advantageously be used when the PARIHS framework is part of the project. In a translation process, differences in cultural specificity, language, and working environment have to be considered. By understanding the context of practice, nurses may enable person-centered care and improve patient outcomes.

Introduction

This article describes the Danish translation and validation of the Context Assessment Index (CAI) (McCormack, McCarthy, Wright, Slater, & Coffey, 2009). The CAI was originally developed to assess readiness for use of evidence in a practice context providing care to older people and showed evidence of acceptable reliability and validity as well as practical utility (McCormack et al., 2009).

Both the original study and the later Swedish translation (Nilsson Kajermo et al., 2013) indicated that the CAI might be a suitable instrument to assess a health care organization's readiness for use of evidence, but also, that further development and evaluation was needed.

Background

The current study is part of a newly established five-year research program: CAPAcity building in clinical Nursing (CAPAN), at Zealand University Hospital (ZUH), Denmark. CAPAN is concerned with developing clinical nursing towards person-centered practice (McCormack & McCance, 2006) and to create and implement a meaningful, accessible and flexible infrastructure for translating and integrating nursing evidence across the departments and specialties at the hospital.

Nurses´ perceptions of evidence is a significant predictor of research translation into clinical practice (Lizarondo, Grimmer-Somers, & Kumar, 2011) but most nurses find that much research evidence is not easily available, applicable or adaptable to clinical practice (Saunders & Vehviläinen-Julkunen, 2016).

CAPAN is inspired by the Promoting Action on Research Implementation in Health Services (PARIHS) framework (Kitson, Harvey, & McCormack, 1998). According to PARIHS, organizational context is considered highly influential for the integration of evidence in healthcare settings. Assessment of context in healthcare settings has been the subject of increasing debate, particularly as the linkage

between context and implementation are intertwined (Pfadenhauer et al., 2015, 2017). However, context is dynamic with variable transparency. As a result, it is difficult to measure the individual components and how these components impact on the provision of person-centred care (Duranti & Goodwin, 1992; Thomsen, Soelver, & Hølge-Hazelton, 2017). Consequently, the development of measurement tools for assessing context may offer greater insight in developing strategies for implementation (Nilsson Kajermo et al., 2013). One example of context assessment tools, that are based on PARIHS and have been translated and tested in international settings, is the Alberta Context Tool (ACT) (Eldh, Ehrenberg, Squires, Estabrooks, & Wallin, 2013; Estabrooks, Squires, Cummings, Birdell, & Norton, 2009; Hoben et al., 2013), another is the CAI (McCormack et al., 2009; Nilsson Kajermo et al., 2013).

The ACT was designed to measure the context of research utilisation (Estabrooks et al., 2009) and the CAI examines the readiness of a practice context for establishing person-centered care with the specific purpose of providing practitioners with an understanding of the context in which they work. The CAI measurements are closely related to the purpose of CAPAN and was therefore chosen as a tool.

Even though testing of the CAI has shown reliability (McCormack et al., 2009) Kajermo et al have suggested, that further evaluation of its psychometric properties is required (Nilsson Kajermo et al., 2013).

Aims of the study

The aims of the current study were to:

1) Describe the translation and adaptation of the CAI for use in Danish hospitals.

2) Evaluate the psychometric properties of the Danish version of the CAI.

Methods

This study consisted of three phases: 1: Instrument translation and modifications. 2: Distribution of the survey. 3: Data analysis.

Phase 1: Instrument translation and modifications

Before entering the translation process, consent was obtained from the instrument copyright holder.

The CAI consists of 37 items with four response alternatives on a Likert scale: *Strongly agree, Agree, Disagree* and *Strongly disagree* and the original model measures a 5-factor model of Collaborative Practice, Evidence informed Practice, Respect for Persons, Practice Boundaries, Evaluation. The 5-factor model has been reported to have acceptable psychometric properties (McCormack et al., 2009).

Two bilingual translators whose first language is Danish produced two independent translations. The translators had different profiles, one with a clinical background and one with no in-depth knowledge of the health care system. This combination contributed to a translation reflecting both a more reliable equivalence from a measurement perspective and a translation that could highlight ambiguous meanings in the original questionnaire (Beaton, Bombardier, Guillemin, & Ferraz, 2000).

Expert review

The two translations were reviewed and discussed by an expert panel consisting of five bilingual nurse researchers, all holding at least a PhD-degree, one member having English as a first language.

The deliberation process consisted of cultural differences in the health care systems, terminology in daily clinical settings, structure of the organization and disparity in the languages. For instance, staff appointments in a UK context differ from the Danish context. Therefore, the distinction of the clini-

cal and non-clinical staff was discussed thoroughly before choosing staff designations. Moreover, the CAI was originally developed for an older people context where multidisciplinary teams are much more integrated than the teams are in general departments at Danish hospitals.

The panel agreed on a version for back-translation.

Back-translation

A professional translator with English as first language made a back-translation to English. The translator had no clinical background and was not aware of the intent and concepts in the questionnaire which could reveal unexpected meanings in the pre-final version (Beaton et al., 2000; Guillemin, Bombardier, & Beaton, 1993; Wild et al., 2005).

The copyright holder was presented with the back-translation to revise and discuss. Item 13, "*Staff have explicit understanding of their* own *attitudes and beliefs toward the provision of care*", raised some discussion as *attitudes* directly translated into Danish has a different meaning in every-day language than it does in English. The translation was subsequently accepted.

Usability testing

To further emphasize the comprehensibility and thereby validate the usability in the target group the questionnaire underwent a cognitive debriefing in a group of nurses similar to the target group (Wild et al., 2005). The pilot respondents were native Danish staff from another similar hospital.

Both the introductory letter, explanatory texts and the items in the CAI were displayed in the same look and digital questionnaire form as the final version would be.

Additionally, in several places of the pilot questionnaire, the respondents could write their opinions on matters such as clarity of language and comprehensibility. These answers identified confusing and unclear language and confirmed cultural relevance. Three items were highlighted as difficult to

interpret. Therefore, these were modified in consultation with the expert panel and subsequently retested in the pilot group.

An explanation of the term *Evidence* was added to the text due to comments from the pilot group regarding insufficient understanding of the term.

The expert panel reached consensus on the final version.

Phase 2: Distribution of the survey

Sample and Setting - Data Collection

The survey consisted of three sections: 1) demographic data, 2) the translation of the CAI, and 3) a number of self-developed questions concerning the nurses attitudes and experiences regarding research in general and the implementation of new knowledge in practice in their local context. The three sections were gathered in an on-line survey developed in SurveyXact ("SurveyXact by Rambøll," 2018), a secure data management application that has certified access and encrypted communication. An email was sent to the individual nurse with a specific hyperlink to the survey. The link could be activated whenever wanted. In this paper, we only report the results from the CAI.

In order to compare the context at ZUH with other hospitals in the region that are not in a transformation process of becoming at university hospital, all 4416 hospital employed nurses from Region Zealand were invited to participate in the study. Of these, 1673 came from the ZUH, 2194 from the non-university hospitals, and 549 from the psychiatric hospital. All nurses were included even if on sick leave, parental leave or leave of absence due to other reasons, as it was possible to complete the questionnaire online. Reminders and a link to the questionnaire were sent to those who had not completed or started the questionnaire within 10 days. Further reminders were sent one

week and two weeks after the first reminder. In total, the questionnaire was open for completion for three months after which it was automatically closed.

The ratio of respondent to item is important in factor analysis and Nunally (1978) recommend at least a ratio of 10:1 while Osborne and Costello (2004) reported the that bigger the sample size the better. In this study a 59:1 ratio of respondent to item was achieved.

Phase 3: Data analysis

SPSS 23.0 and Mplus were used in the statistical analysis of the data set.

The 37-item instrument was tested for appropriateness for factor analysis using Kaiser-Meyer-Olkin measures of sampling adequacy and the Bartlett's test for Sphericity (KMO >0.9 is excellent, Bartletts measure significant (Hutcheson & Sofroniou, 1999). The original model was established using exploratory factor analysis, and the stability of the measurement model was tested in this study using confirmatory factor analysis with an exploratory element. Model modifications were identified using statistical feedback from the modification indices, and based on a criterion of being theoretically relevant, introduced one at a time and selected on highest score first (exceeding scores of 3.98) (Byrne, 2013). Firstly, within factor correlated errors, secondly between factor correlated errors. Only statistically significant relationships were maintained in the final model in order to maintain as parsimonious a model as possible. Acceptable factor loadings were based on the sample size and were set at 0.35 (Hair, Anderson, Black, & Babin, 2010). Cronbach' alpha scores were also generated for the final factors in the model. Acceptable fit statistics were set at Root Mean Square Estimations of Approximation (RMSEA) of 0.05 or below; 90% RMSEA higher bracket below 0.08; and Confirmation Fit Indices (CFI) of >0.90 (Hu & Bentler, 1999).

Inferential statistics and post hoc analyses were performed in order to compare the three sites, ZUH, non-university hospitals and the psychiatric hospital.

Ethical Considerations

Ethical approval was obtained from the regional ethics committee in Denmark (J.nr. 17-000048). Study participants were provided with written information concerning the purpose of the study, instructions for withdrawal and their anonymity of the survey.

Permission for completion of the survey was obtained from the hospital management at each hospital and subsequently at the Data Protection Agency in Denmark (j.nr. 2008-58-0020).

Results

Sample characteristics

Of the invited 4416 registered nurses, 2181 (49.4%) completed the whole questionnaire and 2261 (51.2%) completed the CAI. The response rate varied from 30% to 76.9% for the participating wards. 46 (2.0%) of the respondents held a master degree in nursing, 15 (0.7%) a PhD-degree and 888 (39.3%) reported no formal education other than their nursing degree (in Denmark there is only one nursing degree which is Bachelor of Nursing). Of the respondents, 96.0% were women and the mean age was 45.8 years (range 22 – 76 y). In all, 44.2% (n=999) were from ZUH, 44.0% (n=994) from non-University hospital and 11.9% from the psychiatric hospital (n=268). Incomplete responses (n=164) were excluded from the sample.

Item Analysis

The mean scores for 34 of the 37 items scored at a high level of agreement (>2.5 with 22 items) to strongly agree (>3.0 with 12 items). Examination of the Kaiser-Meyer-Olkin measures of sampling adequacy (0.970) and the Bartlett's test for Sphericity (37372, df=630, p=0.001) indicated that the 37 items were appropriate to analysis using factor analysis ~~(KMO >0.9 is excellent, Bartletts measure significant (Hutcheson & Sofroniou, 1999))~~. A review of the correlations between items showed

that all items were moderate and positively correlated. Rho scores ranged from 0.248 to 0.774, indicating no collinearity between items.

Statistics of Fit of Model

There are two competing measurement models to explain the factor structure of the CAI. McCormack et al (2009) reported strong statistical evidence of a five-factor model, however Kajermo et al (2013) could not confirm the five-factor model and suggested the need to explore a theoretically derived three-factor model that aligned with elements relating to the construct 'Context' in the PARIHS framework. In order to provide the best explanation for the data both measurement models were examined in this study. Examination of the normality of distribution demonstrated that the items were non-normally distributed and Weighted Least Square Mean and Variance (WLSMV) is a robust estimator which does not assume normally distributed variables and provides the best option for modelling categorical or ordered data (Brown, 2015).

Five-factor model

Modifications were permitted, and guided by the suggestions identified in the modification matrix and limited to correlated errors. The original model fit statistics were not acceptable: Root mean square error of approximation (RMSEA) = 0.090; Df = 602; 90%; p = 0.001; RMSEA C.I. = 0.089 – 0.092; CFI = 0.870. Correlated errors both within-factor items and between-factor items were permitted in the model. These included the correlated errors selected base on the modification indices > 5, with highest scored modification introduced first. All correlated errors were statistically significant ($p \leq 0.05$). Once introduced, the model produced acceptable fit statistics: Root mean square error of approximation (RMSEA) = 0.070; Df = 602; 90%; p = 0.001; RMSEA C.I. = 0.069 – 0.072; CFI = 0.924. All factor loading, and fit statistics were acceptable, appropriate and statistically significant (see **Error! Reference source not found.**) and the measurement model was confirmed.

Cronbach alpha scores indicated that four of the five items were acceptable (Collaborative Practice: 0.83, Evidence informed Practice: 0.89, Respect for Persons: 0.77, Practice Boundaries: 0.78, Evaluation: 0.64). One factor (Evaluation) scored 0.64, indicating a score that is slightly below acceptable. However, all Cronbach alpha scores must be viewed with an element of caution especially when using factors with a large number (>6) items within them (Sijtsma, 2009).

Statistically significant differences were noted across hospital sites on the constructs 'Evaluation', (f=18.30, p=0.001) and 'Collaborative Practice' (f=13.09, p=0.001). Post hoc analysis shows these differences to be between the psychiatric hospital (x=2.95) and the other two sites (ZUH (x=2.74) and non-university hospitals (x=2.70)) on 'Evaluation' (p=0.01 and p=0.01 respectively) and 'Collaborative Practice' (psychiatric hospital x=2.83 vs ZUH x=2.80, p=0.01 and non-university hospitals x=2.96, p=0.01 respectively).

Three-factor model

The three-factor model was tested and produced unacceptable fit statistics: Root mean square error of approximation (RMSEA) = 0.090; Df = 602; 90% RMSEA C.I. = 0.089 – 0.092; p = 0.001; CFI = 0.868. All correlated errors were statistically significant (p≤0.05). Correlated errors both within-factors and between-factors items were permitted in the model. Once introduced the model produced acceptable fit statistics: Root mean square error of approximation (RMSEA) = 0.070; Df = 602; 90%; RMSEA C.I. = 0.069 – 0.072; p = 0.001; CFI = 0.923. All factor loading, and fit statistics were acceptable, appropriate and statistically significant (see **Error! Reference source not found.**) and the measurement model was confirmed.

Examination of the Cronbach alpha scores showed the three-factor model too had acceptable scores (Culture 0.89, Leadership 0.72, and Evaluation 0.88).

Statistically significant differences were noted across hospital sites on the three constructs 'Evaluation' (f=3.60, p=0.03), 'Leadership', (f=37.04, p=0.001), 'Culture' (f=5.18, p=0.006). Post hoc analysis shows these differences to be between psychiatric hospital (x=2.81) and non-university hospitals (x-2.72) on 'Evaluation', 'Leadership' with psychiatric hospital (x=2.85, p=0.04) and ZUH (x=2.77, p=0.001); and 'Culture' with psychiatric hospital (x=3.11) and non-university hospitals (x=3.03, p=0.007) and ZUH (x=03.03, p=0.007).

INSERT TABLE 1 HERE

Discussion

The aims of this paper were to describe the translation of the CAI into Danish and to evaluate the psychometric properties of the Danish version. The main findings demonstrated factor loadings and fit statistics were acceptable, appropriate and statistically significant and the measurement models for both the five-factor and three-factor models were confirmed.

Translation and adaptation

When adapting self-report measures to a setting that is different in both country, culture and language, unique methods are necessary. In the translation process, several aspects and differences in cultural specificity, language, and working environment had to be considered. For instance, the original CAI was developed for use in settings providing non-acute care to older people (McCormack et al., 2009). In the UK, multidisciplinary teams (MDT) in older people care settings are integrated differently than in Denmark, which is reflected in the original CAI (e.g. item 10: *HCPs in the MDT have equal authority in decision-making*). In the translation to Danish, the instrument had to be altered so that the Danish edition is neutral to the type of care provided.

In addition, the significantly greater number of participants could alter the results compared to smaller studies.

The degree of interception in the current study is estimated acceptable according to the confirmatory factor analysis. Besides, a definition of evidence was included in the introduction to the questionnaire. Nilsson Kajermo et al. (2013) assessed such a definition as enhancing the validity of the CAI.

Psychometric evaluation

Two main findings emerged when testing the psychometric properties of the Danish version of the instrument with the two models.

Firstly, the two models produced similar findings, and both required similar levels of modification to achieve acceptable statistical fit. By analysing the dataset by both models, we found acceptable factor loadings and produced acceptable Cronbach alpha scores of the Danish version of the instrument.

Secondly, the Danish validation produced different results to the former validation studies of the CAI (McCormack et al., 2009; Nilsson Kajermo et al., 2013). These studies were conducted in other geographical regions and possibly highlight the sensitivity of the tool to variations in context as it was designed to do.

In addition, inferential statistics and post hoc analyses demonstrated that the CAI was able to identify differences across all three sites. All sites scored the constructs in both models positively, however there were statistically significant differences between hospital sites construct scores, with psychiatric units scoring the constructs more positively. This difference was noted more on the three construct version of the CAI.

The CAI focuses on elements of PARIHS, including culture, leadership and evaluation.

Culture: McCormack refers to Drennan's (1992) definition of organizational culture, as 'how things are done around here', it is what holds the organization together and even though it is strong, it can be transformed as responsive to a changing context. In a Danish context, recent sociological research describes that the public sector, due to new public management, has been transformed into a *culture of silence* where staff are expected to be hardened and robust, withholding critique or attempts to change practice (Willig, 2016).

Leadership: Within the PARIHS framework, leadership is identified as something everyone has potential to develop and release (Rycroft-Malone, 2004). However, it is also necessary that nurse leaders have transformative abilities and knowledge about different kinds of evidence (Holge-Hazelton, Kjerholt, Berthelsen, & Thomsen, 2015). In Denmark, evidence based nursing is still in its early years, and can be challenging for leaders to include, particularly in more rural regions such as the one where the present study took place.

Evaluation: Evaluation and documentation are key issues in nursing practice (Blair & Smith, 2012), and at Danish hospitals auditing and benchmarking with other health services have become key activities and tools (Ernst, 2016). The dominating positions in practice are promoting efficiency and standardization, which promote measurement and categorization in nursing (Holen, 2011). The current implementation of a new IT-system, EPIC, is one example of this.

In other words, since the CAI assesses context, it is not surprising that different validation studies showed different results. A systematic review of the cross-cultural equivalence of participation instruments (Stevelink & van Brakel, 2013) highlights the same issue and stresses the importance of being aware of prior testing of cultural validity in new contexts.

Linking Evidence to Action

- If a project is using the PARIHS framework, the three-factor model is relevant as a context assessment tool.
- When adapting self-report measures to a setting that is different in both country, culture and language, unique methods are necessary.
- During the translation process differences in cultural specificity, language, and working environment have to be considered.
- When using CAI, sample size and the variation in setting should be considered as this may produce differences in results.
- By understanding the context of practice, nurses may enable person-centered care and improve patient outcomes.

Strengths and limitations of the study

This study is larger than both the original study consisting of 460 nurses (McCormack et al., 2009) and the later study translating the CAI into Swedish consisting of 375 nurses (Nilsson Kajermo et al., 2013).

In 27 of the 37 items, more than 15% of the respondents chose the highest value that could mirror a ceiling effect. A ceiling effect could be a result from limited response alternatives and can reduce the variability in the gathered data. This bias is also mentioned by Nilsson Kajermo et al. (2013). Furthermore, a sample of the respondents expressed the need to have the opportunity to tick a “do not know” box.

The CAI was tested in several settings, not just one sub-speciality or working environment, neutral to the type of care provided and thereby applicable in many Danish settings.

Conclusions

This study described and evaluated the CAI framework adapted for use in Danish hospitals. Over 2000 nurses covering a wide geographic area tested the instrument, offering a solid basis for evalu-

ating the context of practice, and nurses readiness to implement evidence into practice throughout Region Zealand in Denmark.

The statistics demonstrated that the five- and three-factor model (with modifications) are equally acceptable, however potentially more useful in practice. It also demonstrated that the psychiatric hospital had a more positive workplace context as defined by culture, leadership and the use of evaluation.

The CAI has the potential to provide practitioners with an understanding of context in which they work. This is an important step, in order to enable nurses to integrate evidence and undertake person-centred care, ultimately leading to improved patient outcomes.

The current study establishes the three-factor model, but further research is required.

Acknowledgements

We thank Zealand University Hospital, postdoc Jonathan David Comins and postdoc Elizabeth Emilie Rosted, ZUH, and colleagues from Aarhus University Hospital for assistance and support.

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Table 1: Standardized factor loadings scores of the CAI shown for both five-factor and the three-factor models. The brackets refers to position in the respective models. Five-factor model constructs: Collaborative Practice (CP), Evidence informed Practice (EIP), Respect for Persons (RP), Practice Boundaries (PB) Evaluation (E5). Three-factor model constructs: Culture (C), Leadership (L), Evaluation (E3)

ITEMS	*Three-Factor loading*	*Five-Factor Loading*
1. Personal and professional boundaries between healthcare staff are respected (PB)(C)	0.555	0.543
2. Decisions regarding care and treatment are clearly documented by all employees (RP)(L)	0.541	0.616
3. Healthcare staff work proactively and prospectively (CP)(C)	0.617	0.619
4. All aspects of care and treatment are based on best available knowledge/evidence (EIP)(E3)	0.638	0.565
5. Nurse managers are role models for good clinical practice (RP)(E)	0.626	0.567
6. Healthcare staff allow patients to participate in decisions regarding their own care and treatment (CP) (L)	0.545	0.607
7. The further education of healthcare staff is prioritized	0.627	0.671
8. There is a high level of cooperation between healthcare staff and other professional groups (e.g. secretaries, porters, cleaning) (RP)(E3)	0.541	0.539
9. Healthcare staff receive feedback on the outcome of complaints (E)(C)	0.564	0.714
10. Healthcare staff in an interdisciplinary team have equal authority in clinical decision making (CP) (L)	0.626	0.729
11. Results from audits and/or research are used to develop clinical practice (EIP)(E3)	0.698	0.672
12. Performance and development reviews (PDRs) are conducted on a regular basis, which allows healthcare staff to set goals and reflect on their own practice (E)(C)	0.567	0.625
13. The staff have a clear attitude how to practice of care and treatment (PB)(E3)	0.617	0.730
14. Patients are encouraged to participate actively in their own care and treatment (CP)(E3)	0.588	0.575
15. There is great respect for the patients' privacy and dignity (RP)(C)	0.614	0.745
16. Healthcare staff and other professionals have an understanding of each other's roles (PB)(C)	0.670	0.702
17. The management structure is democratic and inclusive (EIP)(L)	0.723	0.544
18. Relevant information materials are available to patients (e.g. other languages, large print, apps) (E)(C)	0.540	0.532
19. Healthcare staff and patients collaborate on organising personalised care and treatment (CP)(E3)	0.644	0.622
20. Care and treatment are based on thorough assessments (RP)(E3)	0.722	0.725
21. Nurse managers support and encourage staff in being critical of clinical practice (PB)(C)	0.736	0.512
22. Feedback meetings are planned between healthcare staff and patients (CP) (L)	0.521	0.677
23. Nurse managers prioritise staff competence development (EIP)(C)	0.739	0.677
24. The staff use reflective approaches to evaluate and develop practice (e.g. action learning or clinical supervision) (E)(C)	0.671	0.622
25. The organisation's management has great respect for the employees' autonomy (PB)(E3)	0.730	0.612

26. Cultural diversity is accepted and welcomed by the staff (RP)(E3)	0.598	0.542
27. Healthcare staff have easy access to evidence-based knowledge (EIP)(L)	0.682	0.701
28. Patients are able to participate in the assessment (CP)(C)	0.645	0.613
29. Healthcare staff have the opportunity to consult specialists (EIP)(L)	0.672	0.591
30. Healthcare staff feel well-equipped to develop clinical practice (PB)(E3)	0.776	0.633
31. Nurse managers create an environment that promotes the development and exchange of ideas (CP)(C)	0.746	0.716
32. Evidence-based clinical guidelines based on patients' experience, clinical experience and research are available (EIP)(E3)	0.666	0.733
33. Patients are encouraged to give feedback on care and treatment, as well as departmental culture (CP)(C)	0.582	0.593
34. Resources have been allocated for the provision of evidence-based care and treatment (EIP)(C)	0.746	0.779
35. The organisation is non-hierarchical (EIP)(E3)	0.647	0.669
36. Healthcare staff have a common goal for patient care and treatment (RP)(C)	0.718	0.648
37. Structured training programs are available to all healthcare staff (EIP)(E3)	0.651	0.654